

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. – 14. (canceled)

15. (currently amended) A method, comprising:

sealing a device, the device comprising:

a substrate with a top surface;

a first integrated circuit die above the substrate and spaced apart from the substrate by a first distance to form a first volume between the substrate and the first integrated circuit die, the first integrated circuit die having a bottom surface closer to the substrate and a top surface further from the substrate and a plurality of microelectronic devices;

a first plurality of connectors extending from the top surface of the substrate to the bottom surface of the first integrated circuit die and forming an electrical connection between the substrate and the bottom surface of the first integrated circuit;

a second integrated circuit die above the first integrated circuit die and spaced apart from the first integrated circuit die by a second distance to form a second volume between the first integrated circuit die and the second integrated circuit die, the second integrated circuit die having a bottom surface closer to the first integrated circuit die and a top surface further from the first integrated circuit die and a plurality of microelectronic devices;

a second plurality of connectors extending from the top surface of the first integrated circuit die to the bottom surface of the second integrated circuit die;

wherein sealing the device comprises substantially sealing the second volume between the first and second integrated circuit dies from a surrounding environment.

16. (currently amended) The method of claim 15, wherein formation of the device comprises:

fabricating the first integrated circuit die, the fabricated first integrated circuit die having a first set of first portions of the second plurality of connectors;

fabricating the second integrated circuit die, the fabricated second integrated circuit die having a second set of second portions of the second plurality of connectors;

singulating the first integrated circuit die from a first wafer comprising a plurality of integrated circuit dies;

singulating the second integrated circuit die from a second wafer comprising a plurality of integrated circuit dies; and

bonding the first set of first portions to the second set of second portions to connect the first integrated circuit die to the second integrated circuit die.

17. (currently amended) The method of claim 16, wherein the device is sealed after the first and second integrated circuit dies have been singulated from the first and second wafers.

18. (withdrawn) The method of claim 17, wherein the device is sealed by a layer of underfill material and the layer of underfill material substantially fills the second volume between the first integrated circuit die and the second integrated circuit die and around the second plurality of connectors.

19. (currently amended) The device of claim 17, wherein the device is sealed by a layer of underfill material and the layer of underfill material comprises filler particles having an average diameter greater than the second distance between the first integrated circuit die and the second integrated circuit die.

20. (currently amended) The device of claim 17, wherein the first distance between the substrate and the first integrated circuit die is in a range from about 75 microns to about 100 microns, and the second distance between the first integrated circuit die and the second integrated circuit die is in a range from about 100 nanometers to about 200 nanometers.

21. (currently amended) The device of claim 17, wherein sealing the device comprises applying a layer of underfill material extending from the substrate to the second integrated circuit die.

22. (previously presented) The method of claim 17, wherein the device is sealed by a layer of underfill material and the second volume between the first integrated circuit die and the second integrated circuit die and around the second plurality of connectors is substantially free of the underfill material.

23. (currently amended) The method of claim 17, wherein sealing the device comprises applying a layer of material extending from the first integrated circuit die to the second integrated circuit die.

24. (withdrawn) The method of claim 17, wherein sealing the device comprises applying a first layer of underfill material extending from the substrate to the first die and applying a second layer of material extending from the first die to the second die.

25. (withdrawn) The method of claim 15, wherein the device is sealed by a layer of underfill material and the layer of underfill material substantially fills the second volume between the first integrated circuit die and the second integrated circuit die and around the second plurality of connectors.

26. (withdrawn) The method of claim 25, wherein sealing the device occurs after the first die has been bonded to the second die and before the first die has been bonded to the substrate.

27. (new) The method of claim 15, wherein the first plurality of connectors do not extend substantially beyond the top surface of the substrate or the bottom surface of the first integrated circuit.

28. (new) The method of claim 28, wherein the second plurality of connectors do not extend substantially beyond the top surface of the first integrated circuit or the bottom surface of the second integrated circuit.

29. (new) The method of claim 15, wherein sealing the device comprises applying a single layer of underfill material extending from the substrate to the second integrated circuit die, the layer of underfill material being in contact with both the first and second integrated circuit dies.

30. (new) A method, comprising:

sealing a device, the device comprising:

a substrate;

a first integrated circuit die above the substrate and spaced apart from the substrate by a first distance to form a first volume between the substrate and the first integrated circuit die, the first integrated circuit die having a plurality of microelectronic devices;

a first plurality of connectors extending from the substrate to the first integrated circuit die;

a second integrated circuit die above the first integrated circuit die and spaced apart from the first integrated circuit die by a second distance to form a second volume between the first integrated circuit die and the second integrated circuit die, the second integrated circuit die having a plurality of microelectronic devices;

a second plurality of connectors extending from the first integrated circuit die to the second integrated circuit die;

wherein sealing the device comprises substantially sealing the second volume between the first and second integrated circuit dies from a surrounding environment by a layer of underfill material, the second volume between the first integrated circuit die and the second integrated circuit die and around the second plurality of connectors remaining substantially free of the underfill material after sealing.

31. (new) The method of claim 29, wherein the device is sealed after the first and second integrated circuit dies have been singulated from first and second wafers.
32. (new) The method of claim 29, wherein sealing the device comprises applying a single layer of underfill material extending from the substrate to the second integrated circuit die, the layer of underfill material being in contact with both the first and second integrated circuit dies.